US Robotics®

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# & INSTALLATION TROUBLESHOOTING

Sportster® MODEMS

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U.S. Robotics®

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# INSTALLATION & TROUBLESHOOTING

## Sportster® MODEMS

This manual covers installation and operating instructions for the following U.S. Robotics Sportster modems:

- 14,400 internal and external
- 28,800 internal and external

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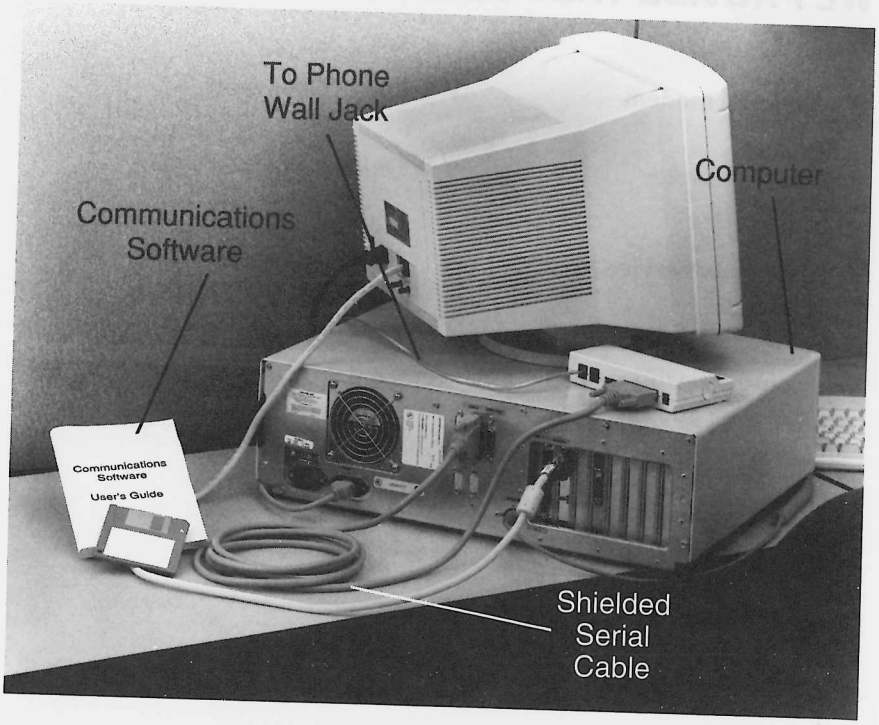
# CHAPTER 1. EXTERNAL SPORTSTER INSTALLATION

## *WE PROVIDE THE FOLLOWING*

- √ External modem
- √ Power adapter
- √ Customer Service Access Card
- √ Communications/Fax software and manual
- √ RJ-11 phone cord
- √ *Quick Installation Guide*
- √ Instructions for downloading the *Technical Reference Guide* from the BBS

## YOU ALSO NEED

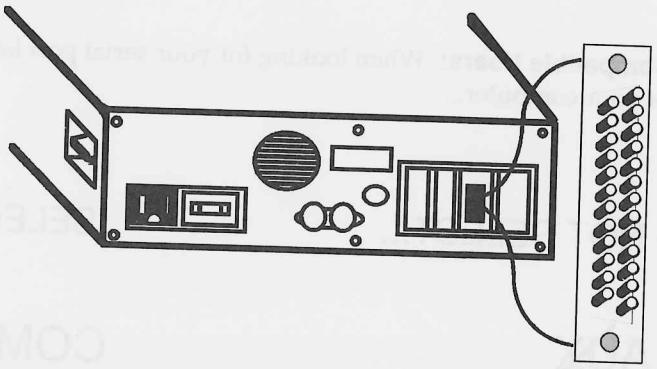


## *SERIAL PORT SELECTION*

**IBM PC-Compatible Users:** When looking for your serial port label on the back of your computer...

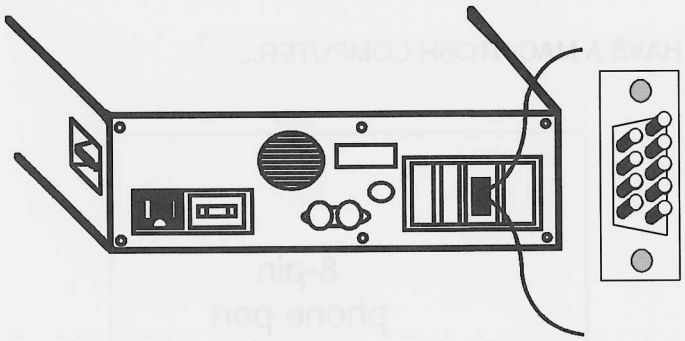
| DO NOT SELECT... | SELECT... |
|---|---|
| ~~AUX~~ | COMx |
| ~~GAME~~ | MODEM |
| ~~LPT~~ | RS-232 |
| ~~PARALLEL~~ | SERIAL |

IF YOUR PC'S SERIAL CONNECTOR LOOKS LIKE THIS...



YOU NEED THIS SHIELDED SERIAL CABLE...

IF YOUR PC'S SERIAL CONNECTOR LOOKS LIKE THIS...



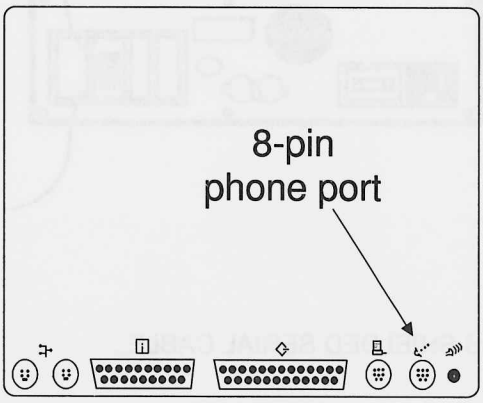
YOU NEED THIS SHIELDED SERIAL CABLE...

To PC
9-Pin Female

To Modem
25-Pin Male

## *MACINTOSH USERS*

IF YOU HAVE A MACINTOSH COMPUTER...




YOU NEED THIS SHIELDED SERIAL CABLE... (Hardware handshaking cable required)

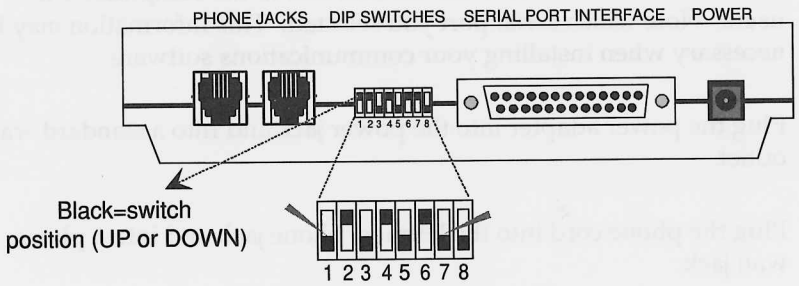
## SPECIAL SERIAL-CABLE ISSUES—3-WIRE CABLE INSTALLATIONS

If your system requires a 3-wire cable, you need to adjust the modem as follows.

1. Turn the modem around so the back panel faces you.

2. With a small instrument, set DIP switch 1 DOWN so that the modem doesn't look for a Data Terminal Ready (DTR) signal from the computer.

3. With a small instrument, set DIP switch 7 DOWN so the modem does not load its Hardware Flow Control template.




**DIP Switches 1 and 7 DOWN**

4. Once you load your communications software, issue the following command to your modem. This command makes the Software Flow Control template the power-on default.

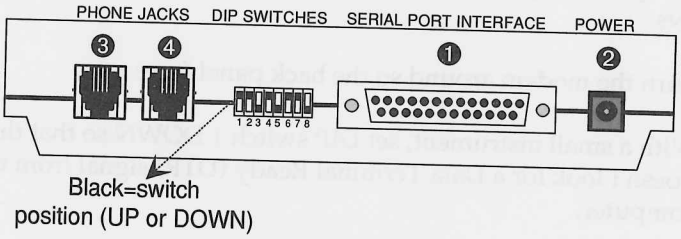
**AT&F2&W <Enter>**

5. With a small instrument, set DIP switch 7 UP again. Your modem should now work properly with a 3-wire cable. **NOTE:** You do not need to repeat this process every time you use your modem.

6. Turn your modem OFF, then back ON for the changes to take effect.

## MODEM INSTALLATION

Turn off your computer and any attached devices. Then match the number in the graphic with its corresponding step.



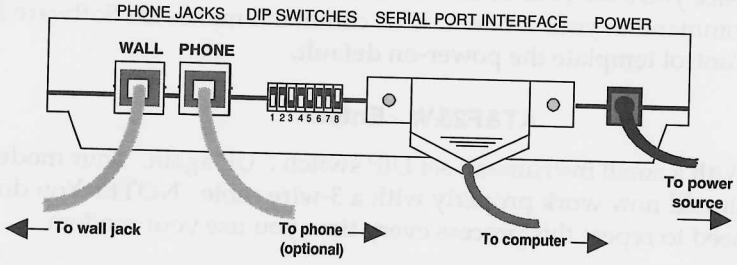

**Sportster back panel**

❶ Connect the serial cable to the modem and to the computer. **PC users:** Note which serial port you selected. This information may be necessary when installing your communications software.

❷ Plug the power adapter into the power jack and into a standard wall outlet.

❸ Plug the phone cord into the leftmost phone jack and into a phone wall jack.

❹ If you wish to use your modem and phone through the same phone wall jack, plug your phone's cord into the other jack on the modem.



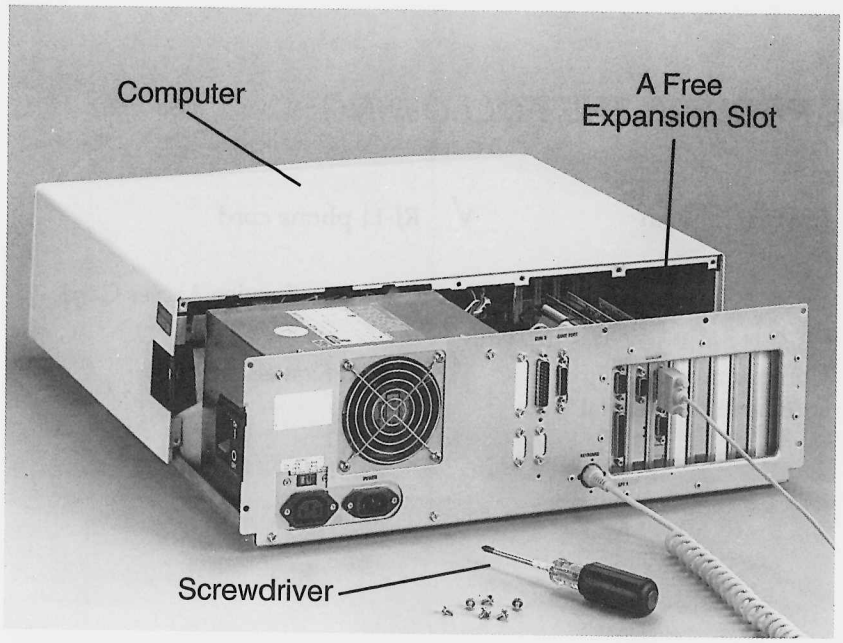

**All cables connected properly**

# CHAPTER 2. INTERNAL SPORTSTER INSTALLATION

## *WE PROVIDE THE FOLLOWING*

- √ Internal modem
- √ *Quick Installation Guide*
- √ Communications/Fax software and manual
- √ RJ-11 phone cord
- √ Customer Service Access Card
- √ *12 Step Express Set-Up*

## *YOU ALSO NEED*



## COM PORTS AND IRQS

COM port and IRQ (Interrupt Request) settings are important to the installation of your modem. Before installing the modem in your computer, check the jumper settings on your modem. The graphics on the next page are provided to help you quickly find these jumpers. The possible selections are clearly marked: COM 1, 2, 3 and 4, and IRQ 2, 3, 4, 5 and 7. Write your modem's settings down for future reference.

We have provided you with a default setting of **COM2** and **IRQ3**. This configuration should work with most systems, so we recommend installing the modem without making any changes.

✍ **NOTE:** If you are familiar with COM ports and IRQs, and you know that this configuration will cause a conflict with another device on your system, try setting the jumpers to **COM3** and **IRQ5** before installing the modem. To move the jumpers, lift the black plastic shunts off the contacts and replace them on the correct contacts. See *Troubleshooting* for more information.

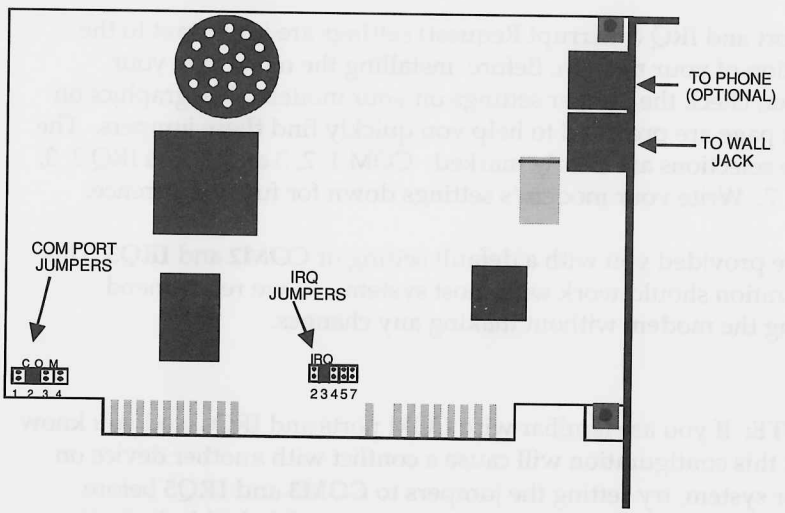
The COM port and IRQ settings on your modem must also match the settings in *Windows*. If you have **NOT** used one of the following combinations, then you will need to change the settings in *Windows*:

| | |
|---|---|
| **COM 1, IRQ 4** | **COM 2, IRQ 3** |
| **COM 3, IRQ 4** | **COM 4, IRQ 3** |

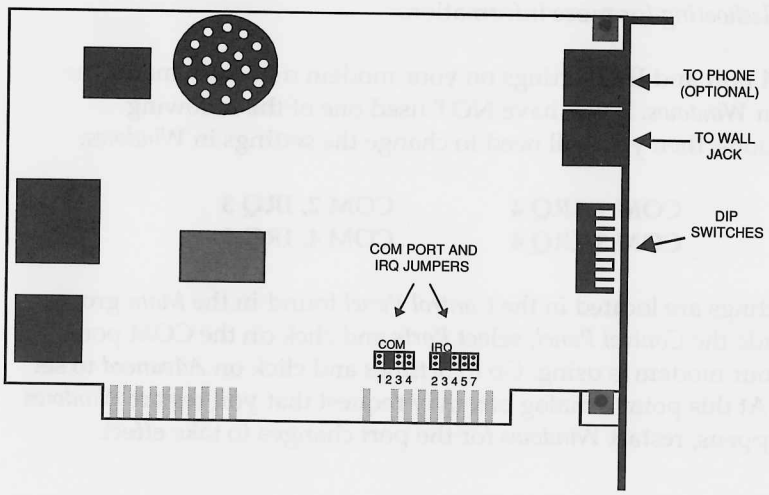
These settings are located in the *Control Panel* found in the *Main* group. Once inside the *Control Panel*, select *Ports* and click on the COM port setting your modem is using. Go to *Settings* and click on *Advanced* to set the IRQ. At this point a dialog box may request that you restart *Windows*. If this happens, restart *Windows* for the port changes to take effect.

# LOCATING THE JUMPERS ON YOUR MODEM

## SPORTSTER 14,400

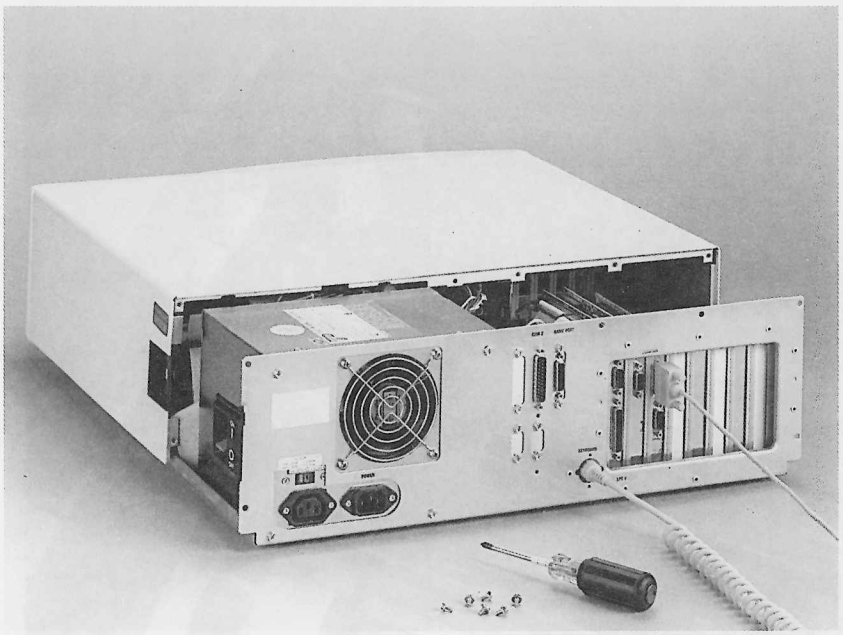



## SPORTSTER 28,800



## MODEM INSTALLATION

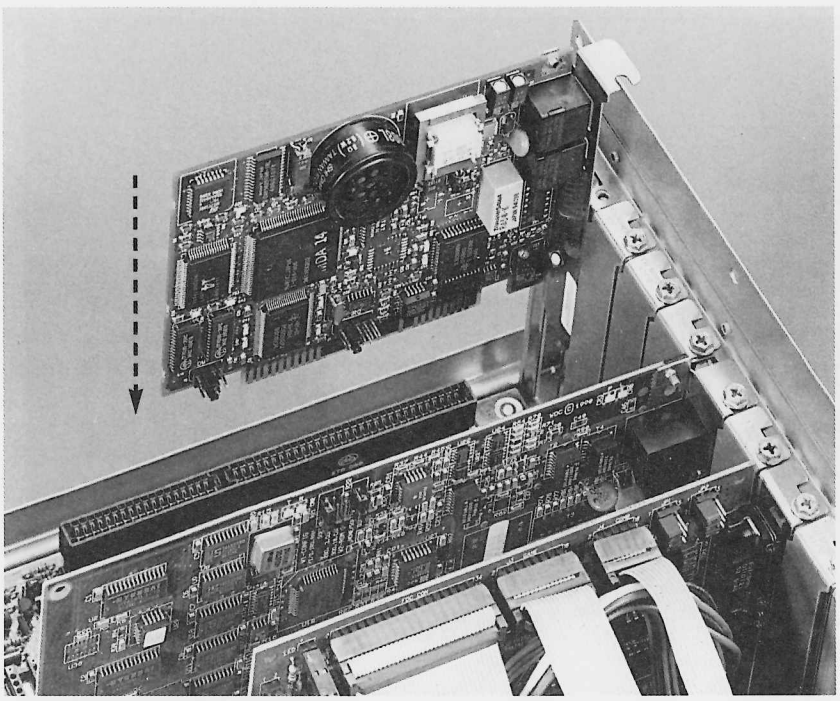
1. Turn OFF and unplug your computer and any peripheral devices.
2. Remove the computer's cover. Refer to the computer manual, if necessary, to see which rear panel screws to remove before sliding the cover off.



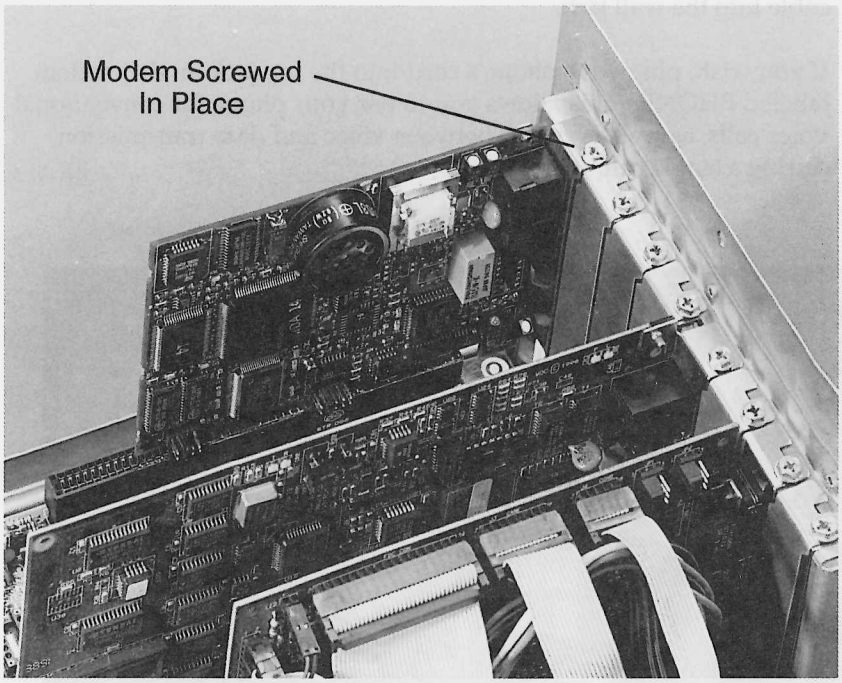
3. Unscrew and remove the solid bracket at the back of any available expansion slot.

4. Insert the modem board into the slot you have chosen, as in the picture below, with the gold leads on the modem board's edge firmly in the slot's groove.

✍ **NOTE:** The following picture shows expansion slots lined up vertically on the floor of the computer. Some computers are configured so that the expansion slots are stacked horizontally. These instructions apply for both configurations.



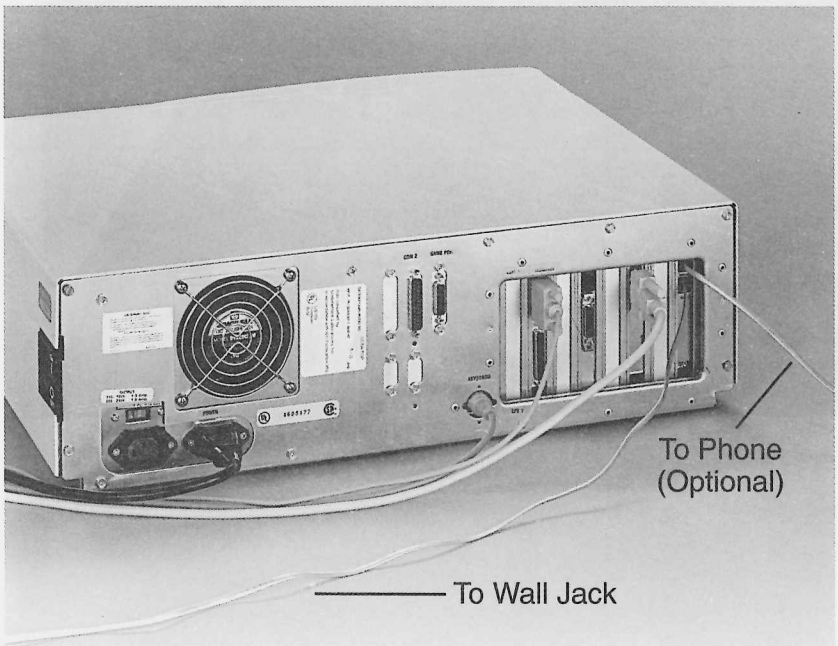
5. Once the modem is in place, screw the bracket at the back of the modem firmly to the computer's rear panel. This ensures that the modem board is firmly in place.



6. Replace the computer cover and all its screws. Reattach all cables and power cords.

7. If you currently have a phone plugged into the wall jack, disconnect it. Plug one end of the phone cable that came with the modem into the TELCO jack at the rear of the modem. Plug the other end of the cable into the wall jack.

8. If you wish, plug your phone's cord into the top jack on the modem labeled PHONE. This allows you to use your phone for conventional voice calls, as well as switch between voice and data transmission during a single call.



# CHAPTER 3. COMMUNICATIONS SOFTWARE AND TESTING

## COMMUNICATIONS SOFTWARE INSTALLATION

Communications software allows you to configure your modem by issuing commands and changing settings. The software included with your modem is preconfigured for optimal performance with the Sportster. When installing and testing this software, refer to its manual.

✍ **NOTE:** If you are not using the software included with your modem, please refer to the software's manual and the following section, *Configuring Your Modem*, for further instructions.

### Configuring Your Modem

Some programs allow you to select your modem type from a menu. Select the appropriate U. S. Robotics Sportster High Speed modem. If yours is not present, try a Courier Dual Standard, V.32 *bis*, V.FC or V.34.

Other programs require you to enter an initialization string in the software *Modem Setup* screen. If this is the case, enter the following string to initialize your modem with the optimal settings:

**AT&F1 <Enter>**

These settings include: hardware flow control, a fixed serial port rate, and full result codes.

If you must use software flow control, enter the following string:

**AT&F2 <Enter>**

## *Configuring Your Communications Software*

1. Turn on your computer (and modem if you have an external).

2. Install your communications software (refer to the software's documentation).

3. If you have an external modem and *Windows*, do the following. Otherwise, skip to Step 4.

   - From DOS, change to your Windows directory and type **MSD.**
   - Type **C** for COM Ports.
   - Find the line *UART Chip Used* and match with the COM port column to which you attached your modem to determine the UART type (usually 8250, 16450, or 16550). Remember your UART type for Step 5.

4. Start your communications software program.

5. Set the software's serial port (baud) rate based on your UART type: Set to 115.2K or 57.6K bps if you have 16550 UART (all internal Sportsters have a 16550 UART on the modem), to 38,400 bps if you have a 16450 UART and 19,200 if you have an 8250 UART.
   Also fix or lock the serial port rate (if referred to as *autobaud*, select OFF).

   **WARNING:** Some communications software packages offer 14,400 and 12,000 bps as serial port rates. *Do not select either of these options* or your modem will not function properly.

6. Specify the serial port used by the modem—typically COM2—and the IRQ used by the modem (typically IRQ3 is used with COM2) in the *Windows Control Panel* or in your communications software if working in DOS.

7. Specify your modem's flow control setting—RTS/CTS for hardware flow control (highly recommended) or XON/XOFF for software flow control. You may have to disable the one you are not using.

8. If your computer has a 16550 UART, enable 16550 UART and/or FIFO support (if your software supports these features).

### *Testing Your Installation*

1. If necessary, perform the software function that puts your computer in *Terminal* mode. A cursor appears on your screen, allowing you to send commands directly to the modem.

2. Type the following command to see if your computer and modem are communicating properly.

   **AT E1 Q V1 <Enter>**

   If the COM port and IRQ settings are correct, the modem responds:

   **OK**

   If the characters you type do not appear, no *OK* appears, or double characters appear, see the *Troubleshooting* section in this guide.

## *CONNECTING TO THE USR BBS*

1. Start your communications software. The software settings for the BBS are as follows:

   **ANSI terminal emulation**
   **Data Bits: 8**
   **Parity: None**
   **Stop Bits: 1**

2. Put your computer in *Terminal* mode. Enter the following command:

   **ATDT 1 708 982 5092 <Enter>**

✍ **NOTE:** If you receive a BUSY signal, use the **A/** command to redial.

3. If this is your first time connecting to our BBS, you will be asked to enter your name and a password, as well as fill out a questionnaire.

4. When you finish registering, press enter with each prompt until you come to the main menu. Select the appropriate letter to perform the desired function.

## Downloading the Technical Reference Guide

If you would like to download the Sportster *Technical Reference Guide* from the BBS, do the following.

1. From the main menu, select *D* for *Download a file.*

2. *Enter filename to Download (Enter) = none?* appears on the screen. Type the name of the file you wish to receive. You have three manual formats to choose from:

   - SPHSWORD.ZIP — The *Guide* in a zipped Word for Windows format. You will need PKUNZIP.EXE to uncompress this file. PKUNZIP.EXE is also available on the BBS.
   - SPHSHELP.ZIP — The *Guide* in a zipped Windows Help format.
   - SPHSASCI.TXT — The *Guide* in an uncompressed ASCII format

3. *Protocol Type for Transfer.* Your selection depends on what your software supports. If possible, make Zmodem your first choice. Xmodem should be your last choice since it is very slow.

4. Depending on the software you are using, you will either be prompted where you want the file placed, or the file will be placed in the directory where your communications software is loaded.

5. When the file transfer is complete, and you are ready to leave the BBS, select *G* (*Goodbye*) from the main menu.

# APPENDIX A. QUICK REFERENCE

## FRONT PANEL LIGHTS (externals only)

| Symbol | Meaning | Status |
|---|---|---|
| AA | Auto Answer/ Answer | Answer mode only: ON if DIP switch 5 is OFF when modem is powered on, or register S0 is set to 1 (Auto Answer), and when answering a call; OFF when modem originates a call. Light flashes when there is an incoming call. |
| CD | Carrier Detect | ON if DIP switch 6 is OFF (factory setting) and modem receives a valid data signal (carrier) from a remote modem, indicating that data transmission is possible. Always ON if the CD override is ON (DIP switch 6 ON). |
| RD | Received Data | Flashes when modem sends result codes or passes received data bits. |
| SD | Send Data | Flashes when computer sends a data bit. |
| TR | Data Terminal Ready | ON if DIP switch 1 is OFF (factory setting) and modem receives a DTR signal from computer. Always ON (modem ignores DTR) if the DTR override is ON, DIP switch 1 ON. |
| CS | Clear to Send | ON until modem lowers CTS when Transmit Data hardware flow control is enabled (&H1, &H3). |
| ARQ/ FAX | Error Control/ Fax Operations | Data Mode: Automatic Repeat Request. ON if modem is set to &M4 or &M5 and successfully establishes an error control connection. Flashes when modem retransmits data to remote modem. Fax Mode: Flashes to indicate fax mode. |

# COMMAND SUMMARY

- Type commands in either upper or lower case, not a combination. Use the Backspace key to delete errors. (You cannot delete the original AT command since it is stored in the modem buffer).
- If a command has numeric options and you don't include a number, zero is assumed. For example, if you type ATB, the command ATB0 is assumed.
- Every command but A/ and +++ must begin with the AT prefix and be entered by typing a Carriage Return (Enter key).
- The maximum command length is 40 characters. The modem doesn't count the AT prefix, Carriage Returns, or spaces.

✍ **NOTE:** All defaults are based on the &F1—Hardware Flow Control template loaded in NVRAM when the modem is shipped. **Defaults are marked with an asterisk (*).**

---

$ Displays a basic command list; online help.

A Manual Answer: goes off hook in answer mode. Pressing any key aborts the operation.

A/ Re-executes the last issued command. Used mainly to redial. This does not require the AT prefix or a Carriage Return.

Any key Aborts off-hook dial/answer operation and hangs up.

AT Required command prefix, except with A/ and +++. Use alone to test for *OK* result code.

B*n* U.S./ITU-T answer sequence.
* B0 ITU-T answer sequence
B1 U.S. answer tone

| | | |
|---|---|---|
| D*n* | Dials the specified phone number. Includes any of the following. | |
| * | P | Pulse (rotary) dial |
| | T | Tone dial |
| | , | (Comma) Two-second pause; linked to S-8 register |
| | ; | (Semicolon) Return to *Command* mode after dialing |
| | " | Dials the letters that follow (in an alphabetical phone number) |
| | ! | (Exclamation point) Flashes the switch hook |
| | / | Delays for 125 msec. before proceeding with dial string |
| | W | Wait for second dial tone (X3 or higher); linked to S6 register |
| | @ | Dials, waits for quiet answer, and continues (X3 or higher) |
| | R | Originates call using answer (reverse) frequencies |
| DL | Dials the last-dialed number. | |
| DS*n* | Dials the phone number string stored in NVRAM at position *n (n* = 0–3*)*. Phone numbers are stored with the &Z*n=s* command. | |
| D$ | Displays a list of Dial commands. | |
| E*n* | Sets local echo. See DIP switch 4. | |
| | E0 | Echo OFF |
| * | E1 | Modem displays keyboard commands |
| F*n* | Sets online local echo of transmitted data ON/OFF. | |
| | F0 | Local echo ON. Modem sends a copy of data it sends to the remote system to your screen. |
| * | F1 | Local echo OFF. Receiving system may send a remote echo of data it receives. |
| H*n* | Controls ON/OFF hook. | |
| | H0 | Hangs up (goes on hook) |
| | H1 | Goes off hook |

| | | |
|---|---|---|
| I*n* | Displays the following information. | |
| | I0 | Four-digit product code |
| | I1 | Results of ROM checksum |
| | I2 | Results of RAM checksum |
| | I3 | Product type |
| | I4 | Current modem settings |
| | I5 | Nonvolatile memory (NVRAM) settings |
| | I6 | Link diagnostics |
| | I7 | Product configuration |
| L*n* | Controls speaker volume (internals only). | |
| | L0 | Low |
| | L1 | Low |
| * | L2 | Medium |
| | L3 | High |
| M*n* | Operates speaker. | |
| | M0 | Speaker always OFF |
| * | M1 | Speaker ON until CONNECT |
| | M2 | Speaker always ON |
| | M3 | Speaker ON after dial, until CONNECT |
| O*n* | Returns online. | |
| | O0 | Returns online |
| | O1 | Returns online and retrains |
| P | Sets pulse dial (for phone lines that don't support touchtone dialing). | |
| Q*n* | Displays/suppresses result codes. See DIP switch 3. | |
| * | Q0 | Displays result codes |
| | Q1 | Quiet mode; no result codes |
| | Q2 | Displays result codes only in *Originate* mode; unstorable in NVRAM on Sportster 14.4 modems with dipswitches |
| S*r*.*b*=*n* | Sets bit *.b* of register *r* to *n* (0/OFF or 1/ON). | |
| S*r*=*n* | Sets register *r* to *n*. (See list of S-register settings on page A-11). | |
| S*r*? | Displays contents of S-register *r*. | |

S$ Displays a list of the S-Registers. (List of S-registers begins on page A-11).

T Sets tone dial.

V*n* Displays verbal/numeric result codes. See DIP switch 2.
V0 Numeric codes
* V1 Verbal codes

X*n* Sets result code displayed. Default is X4.

| | *Xn* Setting | | | | |
|---|---|---|---|---|---|
| Result Codes | X0 | X1 | X2 | X3 | X4 |
| 0/OK | • | • | • | • | • |
| 1/CONNECT | • | • | • | • | • |
| 2/RING | • | • | • | • | • |
| 3/NO CARRIER | • | • | • | • | • |
| 4/ERROR | • | • | • | • | • |
| 5/CONNECT 1200 | | • | • | • | • |
| 6/NO DIAL TONE | | | • | | • |
| 7/BUSY | | | | • | • |
| 8/NO ANSWER* | | | | • | • |
| 10/CONNECT 2400 | | • | • | • | • |
| 13/CONNECT 9600 | | • | • | • | • |
| 18/CONNECT 4800 | | • | • | • | • |
| 20/CONNECT 7200 | | • | • | • | • |
| 21/CONNECT 12000 | | • | • | • | • |
| 25/CONNECT 14400 | | • | • | • | • |
| 43/CONNECT 16800 | | • | • | • | • |
| 85/CONNECT 19200 | | • | • | • | • |
| 91/CONNECT 21600 | | • | • | • | • |
| 99/CONNECT 24000 | | • | • | • | • |
| 103/CONNECT 26400 | | • | • | • | • |
| 107/CONNECT 28800 | | • | • | • | • |
| Functions | | | | | |
| Adaptive Dialing | | | • | • | • |
| Wait for 2nd Dial Tone (W) | | | | • | • |
| Wait for Answer (@) | | | | • | • |
| Fast Dial | | | • | | • |

*Requires @ in dial string; replaces NO CARRIER

Y*n* Selects power-on/reset default configuration.
* Y0 Default is profile 0 setting in NVRAM
Y1 Default is profile 1 setting in NVRAM

Z Resets modem based on current DIP switch settings.
Z0 Resets modem to NVRAM profile selected by Y command
Z1 Resets modem to NVRAM profile 0
Z2 Resets modem to NVRAM profile 1
Z3 Resets modem to factory default profile 0 (&F0)
Z4 Resets modem to factory default profile 1 (&F1)
Z5 Resets modem to factory default profile 2 (&F2)

&$ Displays a list of ampersand (&) commands.

&A*n* Enables/disables ARQ codes.
&A0 ARQ result codes disabled
&A1 ARQ result codes enabled
&A2 V.32 modulation indicator added
* &A3 Protocol indicators added—LAPM/MNP/NONE (error control) and V42BIS/MNP5 (data compression)

&B*n* Sets modem's serial port rate.
&B0 Variable, follows connection rate
* &B1 Fixed serial port rate
&B2 Fixed in ARQ mode, variable in non-ARQ mode

&C*n* Controls Carrier Detect (CD) signal. See DIP switch 6.
&C0 CD override
* &C1 Normal CD operations

&D*n* Controls Data Terminal Ready (DTR) operations. See DIP switch 1.
&D0 DTR override
&D1 DTR toggle causes online *Command* mode
* &D2 Normal DTR operations
&D3 Resets on receipt of DTR

&F*n* Loads a read-only (non-programmable) factory configuration.
- &F0 Generic template
- * &F1 Hardware flow control template
- &F2 Software flow control template

&G*n* Sets Guard Tone.
- * &G0 No guard tone, U.S. and Canada
- &G1 550 Hz guard tone, some European countries, requires B0 setting.
- &G2 1800 Hz guard tone, U.K., requires B0 setting

&H*n* Sets Transmit Data(TD) flow control
- &H0 Flow control disabled
- * &H1 Hardware flow control, Clear to Send (CTS)
- &H2 Software flow control, XON/XOFF
- &H3 Hardware and software control

&I*n* Sets Receive Data (RD) software flow control (see also &R*n*).
- * &I0 Software flow control disabled
- &I1 XON/XOFF signals to your modem and remote system
- &I2 XON/XOFF signals to your modem only
- &I3 Hewlett Packard: Host mode
- &I4 Hewlett Packard: Terminal mode
- &I5 ARQ mode—same as &I2; non-ARQ mode—look for incoming XON/XOFF

&K*n* Enables/disables data compression.
- &K0 Data compression disabled
- * &K1 Auto enable/disable
- &K2 Data compression enabled
- &K3 MNP5 compression disabled

&M*n* Sets Error Control (ARQ) 1200 bps and higher.
- &M0 Normal mode, error control disabled
- &M1 Reserved
- &M2 Reserved
- &M3 Reserved
- * &M4 Normal/ARQ
- &M5 ARQ mode

&N*n* Sets forced connect speed. If connection cannot be established at this speed, the modem will hang up.
- * &N0 Variable rate
- &N1 300 bps
- &N2 1200 bps
- &N3 2400 bps
- &N4 4800 bps
- &N5 7200 bps
- &N6 9600 bps
- &N7 12,000 bps
- &N8 14,400 bps
- &N9 16,800 bps
- &N10 19,200 bps
- &N11 21,600 bps
- &N12 24,000 bps
- &N13 26,400 bps
- &N14 28,800 bps

&P*n* Sets pulse (rotary) dial make/break ratio.
- * &P0 U.S./Canada ratio, 39%/61%
- &P1 U. K. ratio, 33%/67%

&R*n* Sets Receive Data (RD) hardware flow control, Request to Send (RTS)(see also &I*n*).
- &R0 Reserved
- &R1 Modem ignores RTS
- * &R2 Received Data to computer only on RTS

&S*n* Controls Data Set Ready (DSR) operations.
- * &S0 DSR override; always ON
- &S1 Modem controls DSR

&T*n* Begins test modes.
- &T0 Ends testing
- &T1 Analog Loopback
- &T2 Reserved
- &T3 Local Digital Loopback
- &T4 Enables Remote Digital Loopback
- * &T5 Prohibits Remote Digital Loopback
- &T6 Initiates Remote Digital Loopback
- &T7 Remote Digital with self test and error detector
- &T8 Analog Loopback with self test and error detector

&W*n* Writes current configuration to NVRAM templates.
- &W0 Modifies the NVRAM 0 template (Y0)
- &W1 Modifies the NVRAM 1 template (Y1)

&Y*n* Sets break handling.
- &Y0 Destructive, but doesn't send break
- * &Y1 Destructive, expedited
- &Y2 Nondestructive, expedited
- &Y3 Nondestructive, unexpedited

&Z*n*=*s* Writes phone number string *s* to NVRAM at position *n* (*n* = 0–3).

&Z*n*=L Writes last executed dial string to NVRAM at position *n* (*n* = 0–3).

&Z*n*? Displays the phone number stored at position *n* (*n* = 0–3).

&ZL? Displays the last executed dial string.

+++ Escapes to online-command mode.

## DIP SWITCHES (MODEMS WITH DIP SWITCHES ONLY)

| Switch | Factory Setting | Function |
|---|---|---|
| 1 | OFF | Data Terminal Ready (DTR) Override<br>OFF Normal DTR operations: computer must provide DTR signal for modem to accept commands; dropping DTR terminates a call<br>ON Modem ignores DTR (Override) |
| 2 | OFF | Verbal/Numeric Result Codes<br>OFF Verbal (word) results<br>ON Numeric results |
| 3 | ON | Result Code Display<br>OFF Suppresses result codes<br>ON Enables result codes |
| 4 | OFF | Command Mode Local Echo Suppression<br>OFF Displays keyboard commands<br>ON Suppresses echo |
| 5 | ON | Auto Answer Suppression<br>OFF Modem answers on first ring, or higher if specified in NVRAM<br>ON Disables auto answer |
| 6 | OFF | Carrier Detect (CD) Override<br>OFF Modem sends CD signal when it connects with another modem, drops CD on disconnect<br>ON CD always ON (Override) |
| 7 | OFF | Power-on and ATZ Reset Software Defaults<br>OFF Loads Y or Y1 configuration from user-defined nonvolatile memory (NVRAM)<br>ON Loads &F0—Generic template from read only memory (ROM) |
| 8 | ON | AT Command Set Recognition<br>OFF Disables command recognition (Dumb Mode)<br>ON Enables recognition (Smart mode) |

## S-REGISTERS

✍ **NOTE:** To change a setting, use the ATS*r*=*n* command, where *r* is the register and *n* is a decimal value from 0–255 (unless otherwise indicated). References to DIP switches apply only to external and internal modems with dip switches.

| Register | Default | Function |
|---|---|---|
| S0 | 0 | Sets the number of rings on which to answer in Auto Answer Mode. When set to 0, Auto Answer is disabled. (This 0 setting cannot be saved in modems with DIP switches. See DIP switch 5). |
| S1 | 0 | Counts and stores the number of rings from an incoming call. (S0 must be greater than 0). |
| S2 | 43 | Stores the ASCII decimal code for the escape code character. Default character is +. A value of 128–255 disables the escape code. |
| S3 | 13 | Stores the ASCII code for the Carriage Return character. Valid range is 0–127. |
| S4 | 10 | Stores the ASCII decimal code for the Line Feed character. Valid range is 0–127. |
| S5 | 8 | Stores the ASCII decimal code for the Backspace character. A value of 128–255 disables the Backspace key's delete function. |
| S6 | 2 | Sets the number of seconds the modem waits before dialing. If X*n* is set to X2 or X4, the modem ignores this register and dials as soon as it detects a dial tone (fast dials). |

| Register | Default | Function |
|---|---|---|
| S7 | 60 | Sets the number of seconds the modem waits for a carrier. May be set for much longer duration if, for example, the modem is originating an international connection. |
| S8 | 2 | Sets the duration, in seconds, for the pause (,) option in the Dial command. |
| S9 | 6 | Sets the required duration, in tenths of a second, of the remote modem's carrier signal before recognition by the Sportster. |
| S10 | 7 | Sets the duration, in tenths of a second, that the modem waits after loss of carrier before hanging up. This guard time allows the modem to distinguish between a line hit, or other disturbances that momentarily break the connection, from a true disconnect (hang up) by the remote modem.<br><br>While we don't recommend connecting the modem to a line with call waiting, if you have it, you may wish to adjust this setting upward to prevent the modem from misinterpreting the second call signal as a disconnect by the remote modem. A better alternative is to ask your phone company how to temporarily disable call waiting (usually *70W). For example: ATDT *70W *phonenumber*.<br><br>**NOTE:** If you set S10 = 255, the modem will not hang up when carrier is lost. Dropping DTR hangs up the modem. |
| S11 | 70 | Sets the duration and spacing, in milliseconds, for tone dialing. |

| Register | Default | Function |
|---|---|---|
| S12 | 50 | Sets the duration, in fiftieths of a second, of the guard time for the escape code sequence (+++). |
| S13 | 0 | Bit-mapped register. Select the bit(s) you want on and set S13 to the total of the values in the Value column. For example, ATS13 = 17 enables bit 0 (value is 1) and bit 4 (value is 16). |

| Bit | Value | Result |
|---|---|---|
| 0 | 1 | Reset when DTR drops. |
| 1 | 2 | Reserved. |
| 2 | 4 | Reserved. |
| 3 | 8 | On DTR signal, auto dial the number stored in NVRAM at position 0. |
| 4 | 16 | At power on/reset, Auto Dial the number stored in NVRAM at position 0. |
| 5 | 32 | Reserved. |
| 6 | 64 | Disable MNP Level 3 (used for testing Level 2). |
| 7 | 128 | Reserved. |

| | | |
|---|---|---|
| S14 | 0 | Bit-mapped register. Allowable non-default value is 1. |

| Bit | Value | Result |
|---|---|---|
| 0 | 1 | The modem hangs up on receipt of +++, returns to command mode, and sends the NO CARRIER result code. |
| 1–7 | — | Reserved. |

| Register | Default | Function |
|---|---|---|
| S15 | 0 | Bit-mapped register. To set the register see the instructions for S13. |

| Bit | Value | Result |
|---|---|---|
| 0–2 | — | Reserved. |
| 3 | 8 | Reset non-ARQ mode transmit buffer from 1.5K bytes to 128.* |
| 4 | 16 | Disable MNP Level 4; retransmitting the larger Level 4 data blocks may be a problem if you expect a great number of errors during a call. |
| 5 | 32 | Set Backspace key to delete. |
| 6–7 | — | Reserved. |

| Register | Default | Function |
|---|---|---|
| S16 | 0 | Bit-mapped test register. Allowable value is 2. |

| Bit | Value | Result |
|---|---|---|
| 0 | — | Reserved. |
| 1 | 2 | Touch tone dialing test. |
| 2–7 | — | Reserved. |

| Register | Default | Function |
|---|---|---|
| S17 | 0 | Reserved. |

* The 1.5K-byte non-ARQ buffer allows data transfer with Xmodem- and Ymodem-type file transfer protocols without using flow control.

The 128-byte option lets remote users with slower modems stop data you're sending from scrolling off their screens. When remote users send your computer an XOFF (Ctrl-S) and you stop transmitting, the data in transit from your modem's buffer doesn't exceed the size of their screen.

This is also very helpful in situations when a remote modem/printer application is losing characters.

| Register | Default | Function |
|---|---|---|
| S18 | 0 | Test timer for &T*n* loopback testing. Sets the time in seconds of testing before the modem automatically times out and terminates the test. When set to 0, the timer is disabled. |
| S19 | 0 | Sets the duration, in minutes, for the Inactivity Timer. The timer activates when there is no data activity on the phone line; at timeout the modem hangs up. S19 = 0 disables the timer. |
| S20 | 0 | Reserved. |
| S21 | 10 | Sets the length, in 10-millisecond units, of Breaks sent from the modem to the computer; applies to ARQ mode only. |
| S22 | 17 | Stores the ASCII decimal code for the XON character. Valid range is 0–127. |
| S23 | 19 | Stores the ASCII decimal code for the XOFF character. Valid range is 0–127. |
| S24 | 0 | Reserved. |
| S25 | 5 | Sets the duration, in hundredths of a second, that DTR must be dropped so that the modem doesn't interpret a random glitch as a DTR loss. (Most users will want to use the default; this register is useful for setting compatibility with older systems running under older operating software.) |
| S26 | 0 | Reserved. |

| Register | Default | Function |
|---|---|---|
| S27 | 0 | Bit-mapped register. To set the register see the instructions for S13. |

| Bit | Value | Result |
|---|---|---|
| 0 | 1 | Enables ITU-T V.21 modulation at 300 bps for overseas calls; in V.21 mode, the modem answers both overseas and domestic (U.S. and Canada) calls, but only originates V.21 calls. |
| 1 | 2 | Enables unencoded (non-trellis coded) modulation in V.32 mode; rarely used part of ITU-T Recommendation V.32. |
| 2 | 4 | Disables V.32 modulation. |
| 3 | 8 | Disables 2100 Hz answer tone to allow two V.42 modems to connect more quickly. |
| 4 | 16 | See next page. |
| 5 | 32 | See next page. |
| 6 | 64 | Reserved. |
| 7 | 128 | This setting disables the codes and displays the 9600 code instead. The actual rate of the call can be viewed on the ATI6 screen. Used for unusual software incompatibilities. Some software may not accept 7200, 12000 and 14400 bps result codes. |

| Register | Default | Function |
|---|---|---|
| S27 (cont'd) | | *Error control handshaking options:* select the total values of bits 4 and 5. |

| Bit 4 | Bit 5 | Result |
|---|---|---|
| 0 | 0 | Complete handshaking sequence: V.42 Detection, LAPM error control, MNP. |
| 16 | 0 | Disable MNP. |
| 0 | 32 | Disable V.42 Detection and LAPM. |
| 16 | 32 | Combined value of 48 negotiates LAPM without Detection phase. Choose this value if the remote modem uses LAPM but does not support the Detection phase. |

| | | |
|---|---|---|
| S28 | 8 | Sets the duration, in tenths of a second, of the EIA-specified Multimode Training. Default = 8 (.8 seconds). This gives V.32 *bis*,V.FC and V.34 modems additional time to connect with most U.S./Canadian modems at 9600 bps or higher before falling back to attempt a V.23 connection (some U.K. and European phone systems, 1200 bps) or a V.21 connection (U.K. and European, 300 bps).<br><br>If calling/answering low-speed, overseas modems under V.21 or V.23 modulation, setting S28 to zero eliminates the delay, giving a faster connect time. |

| Register | Default | Function |
|---|---|---|
| S29 | 20 | Reserved |
| S30–S33 | 0 | Reserved. |
| S34 | (6)(0) | Default=0 on V.FC and V.34 modems; default=6 on V.32 bis modems. Allowable values for non-V.FC modems are S34=6, S34=7, S34=14, and S34=15. Set this register by adding 6 to the value of the bit or bits you want enabled. |
| | | **Bit / Value / Result** |
| | | 0 / 1 / Disable V.32 *bis*. Used for troubleshooting; U. S. Robotics' Technical Support may require that you disable V.32 *bis* for testing purposes. |
| | | 1–2 / — / Reserved. |
| | | 3 / 8 / Enable V.23 modulation. |
| | | 4–7 / — / Reserved. |
| S35 | 0 | Reserved. |
| S36 | 14 | Reserved. |
| S36 | 0 | Reserved. |
| S38 | 0 | Sets an optional delay, in seconds, before a forced hang-up and clearing of the Transmit buffer when DTR drops during an ARQ call. This allows time for a remote modem to acknowledge receipt of all transmitted data before it is disconnected. Default 0: the modem immediately hangs up when DTR drops.<br><br>This option only applies to connections terminated by dropping DTR. If the modem receives the ATH command, it ignores S38 and immediately hangs up. |

The Following S-Registers apply only to 28,800 modems.

| Register | Default | Function |
|---|---|---|
| S39-44 | 0 | Reserved |
| S51 | 0 | Bit mapped register. To set the register see the instructions for S13. |

| Bit | Value | Result |
|---|---|---|
| 0 | 1 | MNP/V.42 disabled in V.22. |
| 1 | 2 | MNP/V.42 disabled in V.22bis. |
| 2 | 4 | MNP/V.42 disabled in V.32bis. |
| 3-7 | - | Reserved. |

S54 — 0 — Bit mapped register. To set the register see the instructions for S13.

| Bit | Value | Result |
|---|---|---|
| 0 | 1 | Disable 2400 symbol rate. |
| 1 | 2 | Disable 2743 symbol rate. |
| 2 | 4 | Disable 2800 symbol rate. |
| 3 | 8 | Disable 3000 symbol rate. |
| 4 | 16 | Disable 3200 symbol rate. |
| 5 | 32 | Disable 3429 symbol rate. |
| 6 | 64 | Disable Call Indicate (V.34 only). |
| 7 | 128 | Disable V.8 (V.34 only) |

S55 — 0 — Bit mapped register. To set the register see the instructions for S13.

| Bit | Value | Result |
|---|---|---|
| 0 | 1 | Disable 8S-2D map. |
| 1 | 2 | Disable 16S-4D map. |
| 2 | 4 | Disable 32S-2D map. |
| 3 | 8 | Disable 64S-4D map. |
| 4-7 | - | Reserved. |

| Register | Default | Function |
|---|---|---|
| S56 | 0 | Bit mapped register. To set the register see the instructions for S13. |

| Bit | Value | Result |
|---|---|---|
| 0 | 1 | Disasble non-linearing coding. |
| 1 | 2 | Disable TX level deviation. |
| 2 | 4 | Disable pre-emphasis. |
| 3 | 8 | Disable pre-coding. |
| 4 | 16 | Disable shaping. |
| 5 | 32 | Reserved. |
| 6 | 64 | Disable V.34 (V.34 only). |
| 7 | 128 | Disable V.FC. |

| | | |
|---|---|---|
| S57 | 0 | Reserved. |

# APPENDIX B. REGULATORY INFORMATION

## *LIMITED WARRANTY*

U.S. Robotics, Inc., warrants to the original consumer or other end-user purchaser that this product is free from defects in materials or workmanship for a period of five years from the date of purchase. During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with the same or similar model) at our option, without charge for either parts or labor. This warranty shall not apply if the product is modified, tampered with, misused, or subjected to abnormal working conditions (including, but not limited to lightning and water damage).

REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE, AND U.S. ROBOTICS SHALL IN NO EVENT BE LIABLE TO PURCHASER FOR INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND OR CHARACTER.

Some states do not allow the exclusion or limitation of incidental or consequential damages or allow limitations on how long an implied warranty lasts, so the above limitations or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

## FCC REGISTRATION

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received including interference that may cause undesired operations.

RINGER EQUIVALENCE: 0.4B

The following are FCC IDs for various Sportster modems:

CJE-0223, CJE-0235, CJE-0236, CJE-0265
CJE-0266, CJE-0268, CJE-0269

See the bottom of your modem or your modem board for the FCC68 number of your modem.

## DOC (CANADA)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radio-electriques depassant les limites applicables aux appareils numeriques de la classe B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

## UL LISTING/CSA APPROVAL

This information technology equipment is UL-listed and CSA-approved for the uses described in this manual.

## CABLE REQUIREMENTS

The connection from the modem to the computer must be made with a high quality, shielded cable to ensure compliance with FCC limits.

## CONNECTING TO THE TELEPHONE COMPANY

It is not necessary to notify the telephone company before installing the modem. However, the telephone company may request the telephone number(s) to which the Sportster is connected and the FCC information printed on the previous page.

If the modem is malfunctioning, it may affect the telephone lines. In this case, disconnect the modem until the source of the difficulty is traced. Do not use the modem on party or coin telephone lines.

## RADIO AND TELEVISION INTERFERENCE

This equipment generates and uses radio frequency energy and if not installed and used properly, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. The Sportster modem has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause interference to radio or television reception, which you can determine by monitoring reception when the modem is installed and when it is removed from the computer, try to correct the problem with one or more of the following measures.

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Relocate the computer and/or the receiver so that they are on separate branch circuits.

If necessary, consult your dealer or an experienced radio/television technician for additional suggestions. You may find the following booklet, prepared by the Federal Communications Commission, helpful:

*How to Identify and Resolve Radio-TV Interference Problems*
Stock No. 004-000-0345-4
U.S. Government Printing Office
Washington, DC 20402

In accordance with Part 15 of the FCC rules, the user is cautioned that any changes or modifications to the equipment described in this manual that are not expressly approved by U.S. Robotics, Inc. could void the user's authority to operate the equipment.

## FOR CANADIAN MODEM USERS

The DOC, Canadian Department of Communications, (IC) label identifies certified equipment. This means the equipment meets certain telecommunications network protective, operational, and safety requirements. The department does not guarantee the equipment will operate to a user's satisfaction.

Before installing this equipment, make sure you are permitted to connect it to the facilities of the local telecommunications company. You must also install the equipment using an acceptable connection method. In some cases, you may also extend the company's inside wiring for single-line, individual service by means of a certified connector assembly (telephone extension cord). You should be aware, however, that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized facility. Any repairs or alterations made by a user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

For your own protection, make sure that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

**CAUTION:** Do not attempt to make such connections yourself; contact the appropriate electric inspection authority or electrician.

Load Number: 5

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to the telephone loop used by the device, without overloading. The termination on a loop may consist of any combination of devices, subject only to the requirement that the total of the Load Numbers of all the devices not exceed 100.

# TROUBLESHOOTING

# YOUR

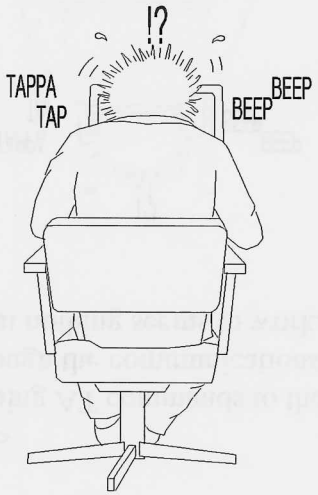
# SPORTSTER

# MODEM

# TROUBLESHOOTING YOUR SPORTSTER MODEM

## PROBLEM

You try issuing AT commands to the modem through the communications software, but nothing seems to work.




## SOLUTION

- Make sure the modem is ON.
- Make sure you selected the correct serial port and IRQ in your communications software, and/or in your Windows Control Panel.
- Make sure the computer is in *Terminal* mode.
- Type in all upper (AT) or lower case (at).

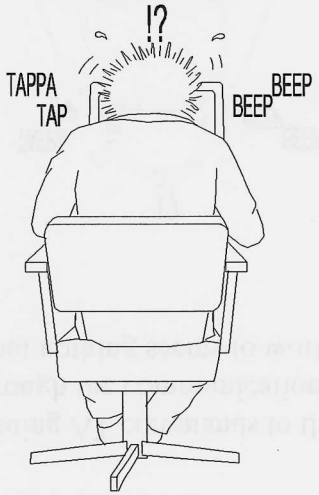
If your modem has dip switches…

- DIP Switch 3 must be ON (result codes).
- DIP Switch 8 must be ON (smart mode).

<continued on next page>

## PROBLEM

<continued>
You try issuing AT commands to the modem through the communications software, but nothing seems to work.

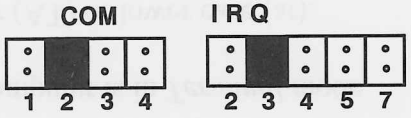



## SOLUTION

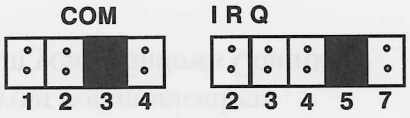
If none of the solutions on the previous page alleviate the problem, there is probably a COM port/IRQ conflict.

Refer back to *Modem Installation*. You will need to remove your modem from the PC and change your COM port and IRQ settings as follows:

**DEFAULT:**



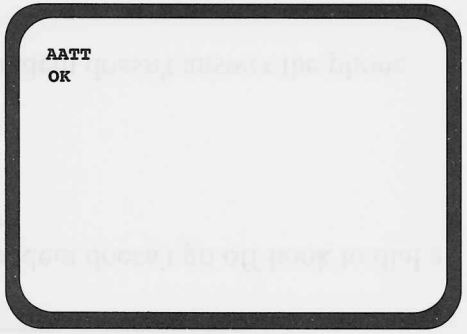

**CHANGE TO:**




If you change your COM port and IRQ settings, also make the changes in your software and in *Windows*.

## PROBLEM

Your modem displays double characters on your monitor. Both your modem's and software's local echoes are on.




## SOLUTION

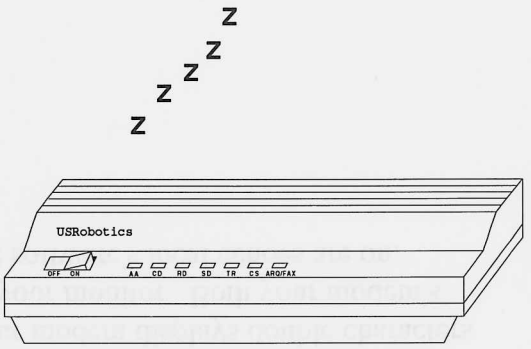
- Turn the software's local echo off with the following command:

**ATE0 <Enter>**

## PROBLEM

Your modem doesn't go off hook to dial a number.

Your modem doesn't answer the phone.



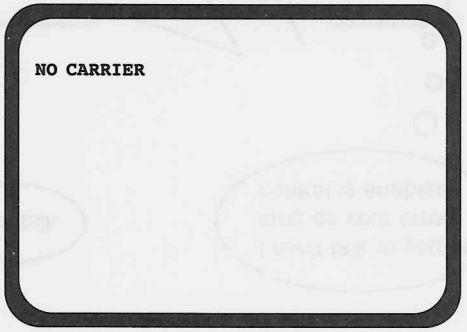

## SOLUTION

- Make sure the phone cord is connected to the jack on the modem, labeled *telco*, and to a phone wall jack.
- Review your software manual to see what DTR operations are required. You may need to change the DIP switch 1 setting.
- Make sure DIP switch 5 is set OFF.
- Make sure that your software has auto answer enabled.

**NOTE:** Your modem may or may not have dip switches. If your modem has dip switches and you change a DIP switch setting, reset the modem with the ATZ command.

## PROBLEM

Both modems exchange carrier signals but fail to establish a communications link.




## SOLUTION

- Place the call again. The telephone company routes even local calls differently each time you call.

- Call a different modem to see if the problem persists. The problem may be with the modem you first tried to call.

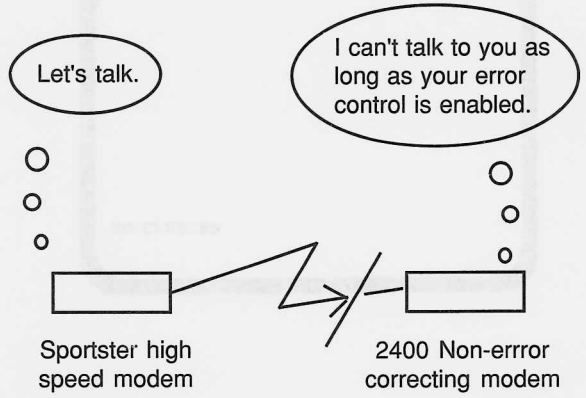
- The remote modem might be an older 2400 bps modem that does not support error control. Disable error control with the following command:

  **AT&M0 <Enter>**

  Place the call again.

## PROBLEM

When your modem originates a call, it doesn't connect at 2400 bps with a 2400 bps modem.


Let's talk.
I can't talk to you as long as your error control is enabled.
Sportster high speed modem
2400 Non-errror correcting modem

## SOLUTION

- The remote modem might be an older 2400 bps modem that does not support error control. Disable error control with the following command:

  **AT&M0 <Enter>**

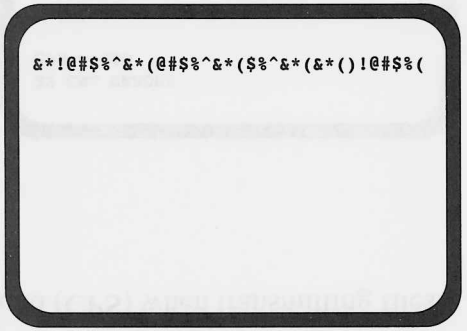
- Try connecting with the remote modem again.

  **NOTE:** When the call is finished, remember to reset the modem:

  **ATZ <Enter>**

## PROBLEM

During data transfer, your screen displays random or garbage characters.




## SOLUTION

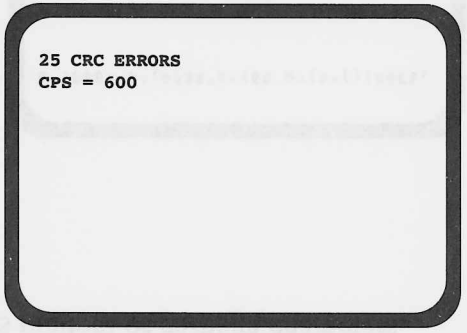
- Set your software to the same word length, parity, and Stop bits as the remote modem.
- Make sure that your software and modem are set to the same flow control setting, and to either a fixed or variable serial port rate.
- Type the following command to load the template that enables hardware flow control as well as other optimal settings.

  **AT&F1 <Enter>**

- Disable any Terminate and Stay Resident (TSR) programs running in the background.

## PROBLEM

Your communications software is reporting many Cyclic Redundancy Check (CRC) errors and low Characters Per Second (CPS) when transmitting files.




## SOLUTION

- You might have a bad phone line. Place the call again. The phone company routes even local calls differently each time you call.
- Type the following command to load the template that enables hardware flow control as well as other optimal settings.

  **AT&F1 <Enter>**

- Lower the serial port rate in your communications software to 38,400 bps or 19,200 bps.
- Try a different file transfer protocol (do not use Xmodem if other protocols are available).
- Disable any TSRs (*Terminate and Stay Resident* programs, for example, anti-virus utilities) that are running.

## PROBLEM

Errors are occuring in your V.17 fax transmissions (fax modems only).

## SOLUTION

- Enter the following initialization string in your software modem setup screen:

  **AT&H3&I2&R2S7=90**

- Disable any TSRs that are running in the background.

- If your problems occur when you send faxes from Windows, and your computer has a 16550 UART, load the comdriver that came with your fax software. (This may require re-installing the software.)

## PROBLEM

**Internal modem users only:** If you have run DOS 6.0's Double Spaced program, do the following before running any fax software.

```
EMMEXCLUDE=C800-D1FF
```

## SOLUTION

**Windows Users:**

- Open the Windows SYSTEM.INI file.
- Add the following line under the [386 Enh] header:

  **EMMEXCLUDE=C800-D1FF**

Non-Windows Users:

- Open the DOS CONFIG.SYS file.
- Add the second line below the first:

  **device=c:\dos\himem.sys**
  **device=c:\dos\emm386.exe noems x=c800-d1ff**

When you are done, reboot your computer.

## PROBLEM

If you are running DOS 6.0, run the following DOS program before you run your fax software.

Type VER at the DOS prompt to determine your version of DOS.

```
C:\>ver
MS-DOS Version 6.00
```

## SOLUTION

- Run the program MEMMAKER.EXE from the DOS directory prompt.

  This program loads all of your TSRs in the most efficient order.

## ARE YOU STILL HAVING PROBLEMS?

- Review this manual.
- Call or visit your modem dealer. They will be able to give you the assistance you need. This is much more efficient and time-saving than returning the modem to U.S. Robotics.
- If your dealer can't help you, please contact U.S. Robotics Customer Support.

| | |
|---|---|
| **USR BBS** | **(708)982-5092** |
| **Fax on Demand** | **(800)762-6163** |
| **Compuserve** | **GO USROBOTICS** |
| **Internet** | **support@usr.com** |
| **Fax** | **(708)676-7323** |
| **Hotline** | **(708)982-5151** |

## IF YOU MUST RETURN THE MODEM TO US . . .

- The Service Representative you talk to will give you a Return Materials Authorization (RMA) number.
- Ship the unit, postage paid, in a strong box made of corrugated cardboard with plenty of packing material (preferrably the original container).
- Include your RMA number, name and address on the shipping label as well as inside the package.
- Ship to the following address:
  **Technical Support Department**
  **RMA #**
  **U.S. Robotics, Inc.**
  **8100 N. McCormick Blvd.**
  **Skokie, IL 60076-2999**